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Route To:

Subject: Bark Beetle Activity in Forest Health Restorations Projects on the Williams RD (williamsrd)

To: District Ranger, Williams RD, Kaibab NF

On September 14 and 15, 2005, I visited the Williams RD, Kaibab NF, at the request of Mark Herron to evaluate developed recreation sites and potential forest health restoration projects on the District for bark beetle activity. I describe in this report what bark beetle activity was observed in these areas and make recommendations to minimize future bark beetle impacts. Additional discussion of bark beetle biology and management actions aimed at reducing bark beetle caused impacts was provided in previous site visit reports sent to the District in October 2003 and September 2004.

Bark Beetle Activity in Developed Recreation Sites on the Williams RD

Trees growing in developed recreation sites are often stressed due to repeated damage caused by campers and soil compaction caused by roads and large vehicles parked off-road. During periods of drought or below-average precipitation such as has been occurring over the last few years, these trees can become particularly stressed.

To reduce the local population of bark beetles within the vicinity of the recreation sites, removal of infested trees at all four of the recreation sites occurred during the springs 2003 through 2005. In addition, thinning of ponderosa pine stands to reduce the long-term susceptibility of the recreation sites occurred in the fall of 2004. Slash generated from these thinning projects was treated by chipping the slash and then removing the chips from the site in the spring of 2005.

My surveys of the four recreation sites consisted of walkthroughs looking for signs and symptoms of bark beetle attack (fading foliage on trees, pitch tubes, and boring dust). It is important to note that additional trees may have become infested after my survey was completed. Therefore, the numbers of infested trees reported here should not be considered absolute.

Cataract Lake Campground

Two currently-infested blackjack ponderosa pine trees (< 16 inches dbh) were found by the entrance gate to Cataract Lake CG.

Kaibab Lake Campground

Two ponderosa pine trees that are currently infested with western pine beetle were located within the Kaibab Lake CG. A few blackjack-sized ponderosa pine trees, which were located next to slash piles outside the immediate campground area, had been attacked by pine engraver beetles.

Dogtown Lake Campground

Only one current infested ponderosa pine trees was identified within the immediate campground area.

Whitehorse Lake Campground

Four large yellow pines were attacked and currently infested with western pine beetle within the boundaries of this developed recreation site. In addition, a pocket of four current infested trees were found behind the dam near slash piles generated from thinning. A limited amount of bark beetle activity was observed elsewhere in the vicinity.

City Project and Saginaw-Kennedy Forest Health Projects

City Project

The Williams RD is proposing to non-commercially thin a total 300 acres of ponderosa pine forest in 2006 within the City Project area. The primary objectives for this thinning are to improve forest health, to improve stand and individual tree resilience and vigor, to reduce risk of catastrophic wildfire, and to improve vegetative species diversity. The City Project area is located in the WUI zone surrounding the City of Williams. The 300 acres proposed for thinning is part of 2,366 acres proposed for precommercial thinning in the City Project.

I examined two areas proposed for non-commercial thinning for bark beetle activity and general stand conditions. Areas inspected were near the Three Sisters Burn Pit and the Reneke Knoll area. These areas have experienced high bark beetle-caused mortality over the past few years and are currently experiencing low to moderate bark beetle activity (***Figure 1***). The stands to be thinned range from dense stocking levels (120 to 300 trees per acre) to extremely dense stocking levels (300 to 2,000 trees per acre). Trees are mostly ponderosa pine saplings to small sawtimber (4 to 18" diameter) with scattered larger pine in the overstory. Tree stocking levels are 5 to 25 times greater than pre-Euro American settlement stocking levels. In addition, the continual introduction of fresh slash, and possibly infested slash, into the burn pit has likely contributed to elevated pine engraver beetle activity in the forested areas surrounding the pit (***Figure 1***).

These high densities of trees reduce both individual tree and stand vigor which increases stand susceptibility to mortality from bark beetles. Over the past several years the Kaibab National Forest has seen an epidemic build-up of bark beetle populations with a large amount of associated mortality in ponderosa pine. Excess competition from smaller trees has also greatly increased the risk of loss due to mortality of the scattered large yellow pine and large oak in the area. Continuous interlocking crowns and well-developed fuels ladders leaves vegetation on these sites at a high risk of loss from catastrophic wildfire. A few sites proposed for thinning in the City area also have some scattered pockets of dwarf mistletoe infection in ponderosa pine.

Proposed treatments include thinning trees up to 9" to 12" diameter at breast height (DBH) to a final spacing of 25 to 30 feet. Mostly ponderosa pine will be thinned but other tree species may also be thinned to reduce overall tree density. Slash generated from the felling of trees would mostly be lopped and scattered to a height of 2 feet or less. In areas where activity slash is heavy or is near private property, activity slash will be piled. This request includes 150 acres of piling of activity slash. In addition, ponderosa pine up to 12" in diameter will be cleared for a distance of up to 30' around large oak and yellow pine. Where dwarf mistletoe exists, pine up to 16" in

diameter may be felled. The proposed noncommercial thinning along with associated activity slash treatments will generally reduce the Fire Regime Condition Class for the treated sites from a Condition Class 3 to a Condition Class 2.

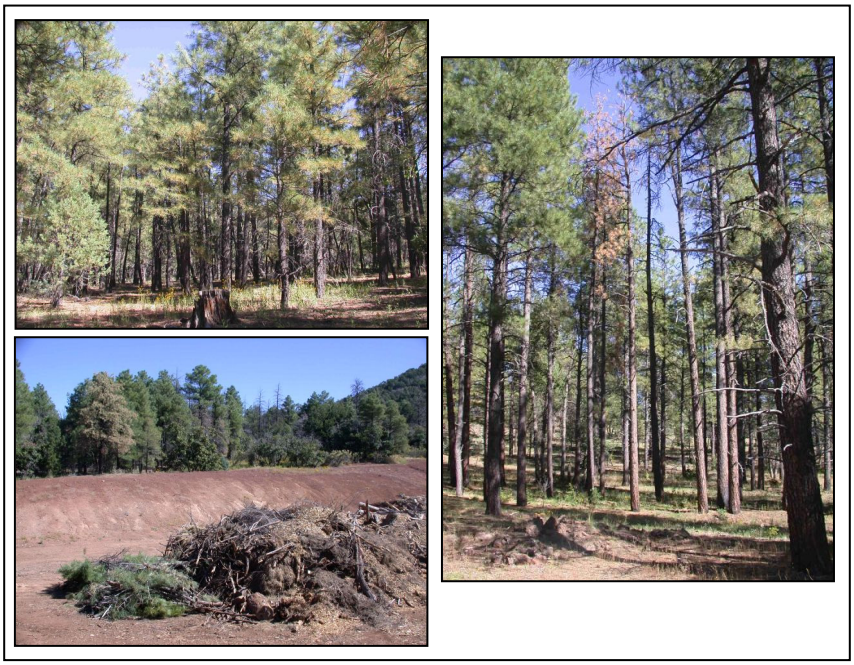

Figure 1. *Forest stand conditions within the City Project area near Williams, AZ, consist of densely stocked ponderosa pine at Three Sisters Burn Pit (top left) and near Reneke Knoll (far right). Ponderosa pine mortality adjacent to Three Sisters Burn Pit (bottom left).*

Saginaw-Kennedy

The Williams Ranger District is proposing to non-commercially thin and machine pile a total 150 acres of ponderosa pine forest in 2006 in the Saginaw-Kennedy project area. The primary objectives for this thinning are to improve forest health, to improve stand and individual tree resilience and vigor, to reduce risk of catastrophic wildfire, and to improve vegetative species diversity. The sites to be thinned are part of a previous timber sale that defaulted. Recent evaluation of these sites indicated that a commercial sale was probably not economically viable for these sites, but a decrease in stand density is still needed.

I examined two areas proposed for non-commercial thinning for bark beetle activity and general stand conditions within the Saginaw-Kennedy forest health restoration project; Unit 21 near FS Road 126 south of Corral Tank and Unit 12 adjacent to FS Road 105. About 20% of Unit 12 was burned by a recent wildfire and moderate levels of western pine beetle activity were observed adjacent to the burn. Moderate to high levels of bark beetle activity were occurring in Unit 21, which is slightly lower in elevation and has poorer site quality (***Figure 2***). Overall, similar to the City Project, many of the stands throughout the project area are densely stocked (120 to 300 trees per acre) consisting mostly of ponderosa pine saplings to small sawtimber (4 to 14" diameter) with scattered larger pine in the overstory. Treatment would include thinning ponderosa pine trees from to 3" to 14" DBH to an approximate average basal area density of 50 to 60 ft^2/acre. Additional clearing will be done around large old yellow pine in order to increase their longevity. Additional trees less than 5" in diameter that were originally not marked will also be thinned.

Recommendations

Recreation Sites

Because of the relatively low bark beetle activity and completed thinning projects within the recreation sites surveyed, 2006 actions should probably be restricted to prompt removal of currently infested trees. The removal of infested trees this fall should reduce the short-term susceptibility of these areas to bark beetle attack. The completed thinning treatments should decrease the long-term susceptibility of these areas to bark beetle attack. Felling of infested trees will not kill developing brood; infested trees must either be removed from the site or treated on site.

Figure 2. *Bark beetle-caused mortality of ponderosa pine in the Saginaw-Kennedy Project area.*

City Project and Saginaw-Kennedy Forest Health Projects

I recommend that priority be given to the City Project as this project is within the Wildland Urban Interface (WUI) and in close proximity to the town of Williams; however, both proposed non-commercial thinning treatments proposed by the District will help to reduce the overall susceptibility of stands to bark beetle attack in the long term as well as improve overall tree vigor, lessen risk of catastrophic wildfire, and improve vegetative species diversity. Thinning from below has been experimentally demonstrated to increase the resistance level of the residual mature pine overstory (Feeney, et al., 1998). Thinning slash may pose a short-term risk to residual trees in the thinning units or surrounding areas depending on the timing of thinning, local population of pine engraver beetles, and site and environmental factors such as site quality and precipitation. Careful monitoring of beetle populations associated with these thinning projects should be implemented. Parker (1991) provides guidelines for minimizing pine engraver beetle impacts associated with thinning treatments.

Prevention and Suppression funds may be available for FY 2006 from Forest Health Protection to implement projects related to bark beetle activity in these recreation sites. Requests for these funds should be submitted no later than October 15, 2005.

If you have any questions regarding my assessment of current bark beetle activity within the proposed project areas or my recommendations, please let me know.

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